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SYNTHESIS, CHARACTERIZATION AND CO2 SORPTION CAPACITY MEASUREMENTS OF SELECTED IONIC LIQUID POLYMERS

A. Vijaya Bhaskar Reddy,[1] Muhammad Moniruzzaman,[1,2] Bidyut Baran Saha,[3] N. Bakthavatchala Reddy,[4] Grigory V Zyryanov[4,5]

[1]Centre of Research in Ionic Liquids (CORIL), Universiti Teknologi PETRONAS, 32610 Seri Iskandar, Perak, Malaysia
[2]Department of Chemical Engineering, Universiti Teknologi PETRONAS, 32610 Seri Iskandar, Perak, Malaysia
[3]International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), and Department of Mechanical Engineering, Graduate School of Engineering, Kyushu University, 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan
[4]Ural Federal University, Chemical Engineering Institute, Yekaterinburg, 620002, Russian Federation.
[5]I. Ya. Postovskiy Institute of Organic Synthesis, Ural Division of the Russian Academy of Sciences, 22 S. Kovalevskoy St., 620219 Yekaterinburg, Russian Federation.
[*] Corresponding authors, E-mail*: m.moniruzzaman@utp.edu.my, vijay.dr555@gmail.com*

Abstract. Ionic liquids (ILs) technology has been emerged as the most prominent approach for the encapsulation of CO_2 from flue gases, which is an important phenomena in oil & natural gas industry during the gas sweetening process. The remarkable performance of IL polymers for the CO_2 capture provided new opportunities to upgrade this technology in recent years. Therefore, in the present study, we have prepared different IL polymers namely poly(1-vinylimidazole), poly(1vinyl-3-ethylimidazolium bromide), poly(1-vinyl-3-ethylimidazolium bis (trifluoro methylsulfonyl))imide and zeolite incorporated poly(1-vinyl-3-ethylimidazolium bis (trifluoro methylsulfonyl)imide materials and evaluated their relative efficiency for the separation of CO_2. The synthesized IL polymers were characterized by FT-IR, FE-SEM and EDX. The CO_2 sorption experiments were conducted to evaluate the efficiency of synthesized IL polymers using gas sorption cell. The results revealed that, the IL-zeolite polymer has adsorbed highest amount of CO_2 and recorded the highest pressure drop compared to other polymer ionic liquid and monomer ionic liquid materials.